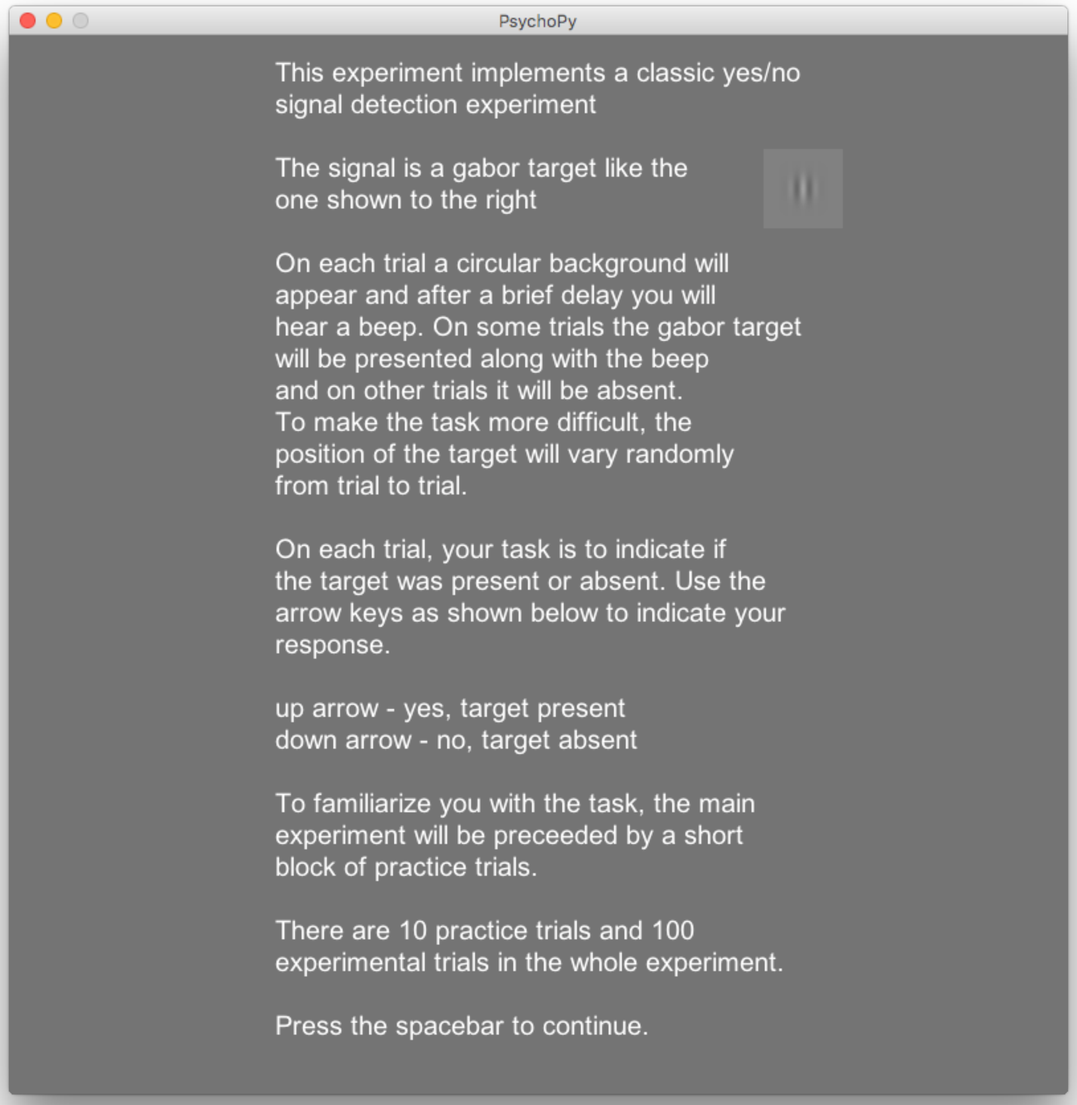
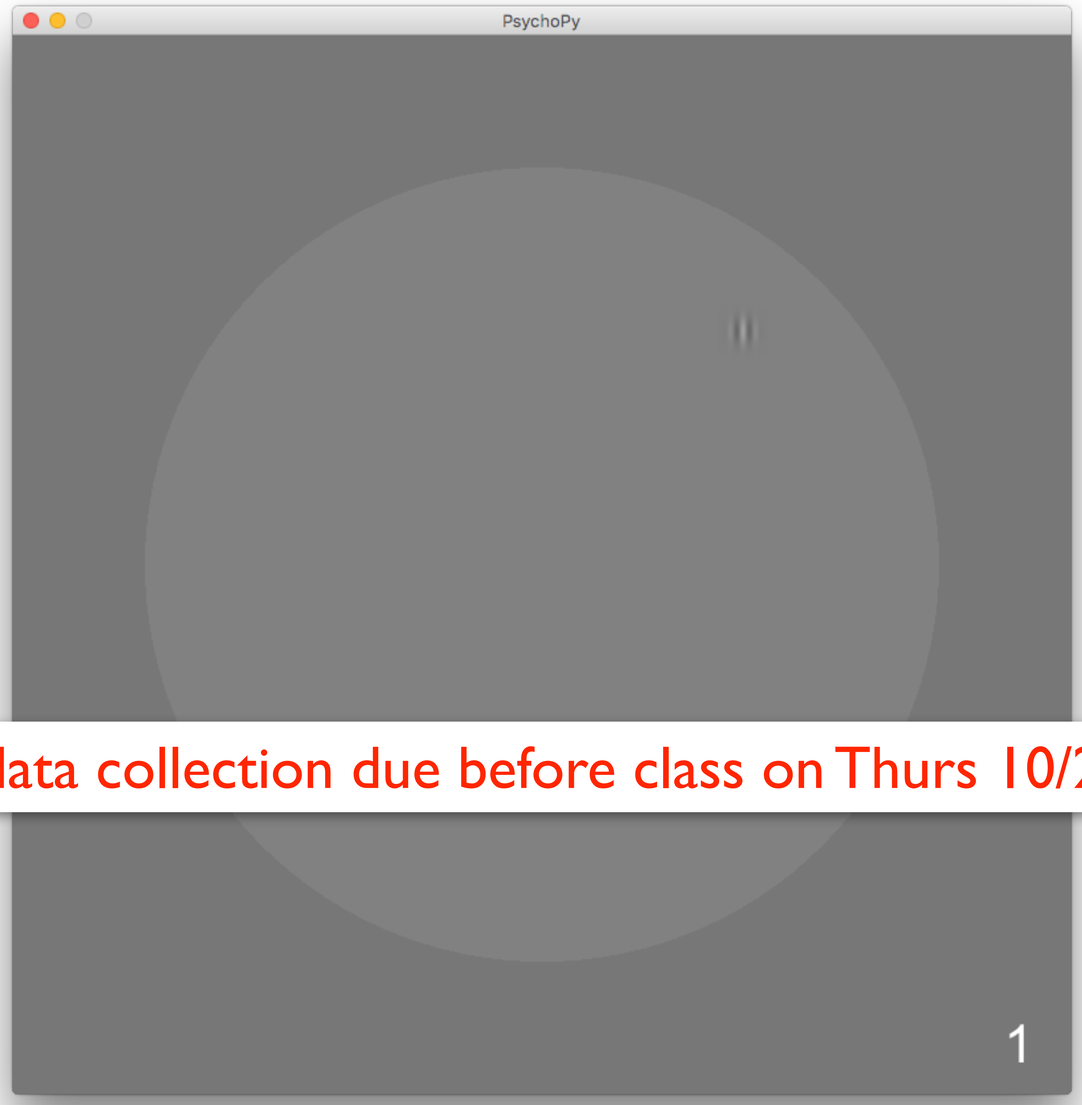
Lab 3 assignment: SDT experiments

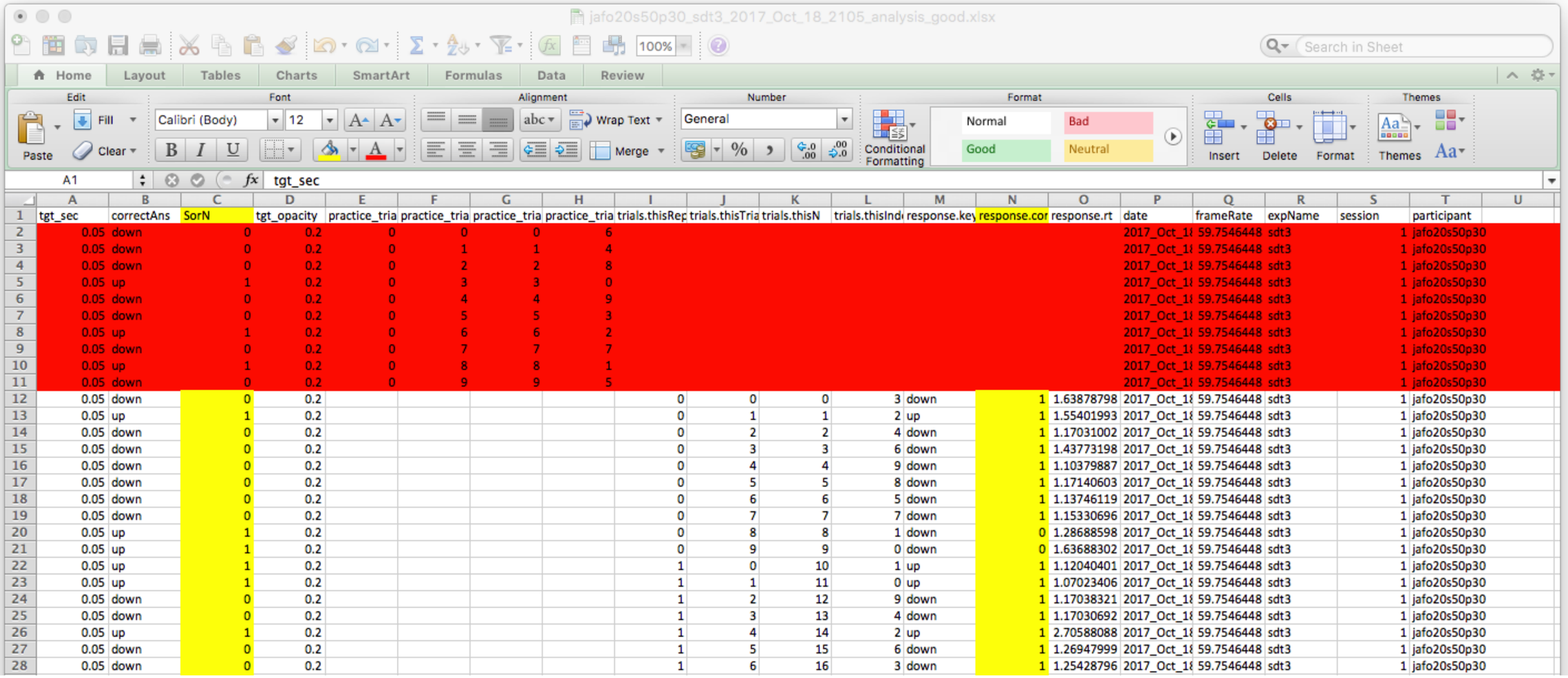




data collection due before class on Thurs 10/26

1. Download the **sdt.zip** file containing the code for the three experiments from myCourses. Unzip the file to extract the code.
2. Use PsychoPy to run yourself through each of the experiments (sdt30, sdt50, sdt70).
   2.1. Make sure to use a unique participant id for each experiment so you can find its data file.
   2.2. If an experiment hangs at the end, use the red X button in PsychoPy to stop it explicitly.

Lab 3 assignment: SDT analysis



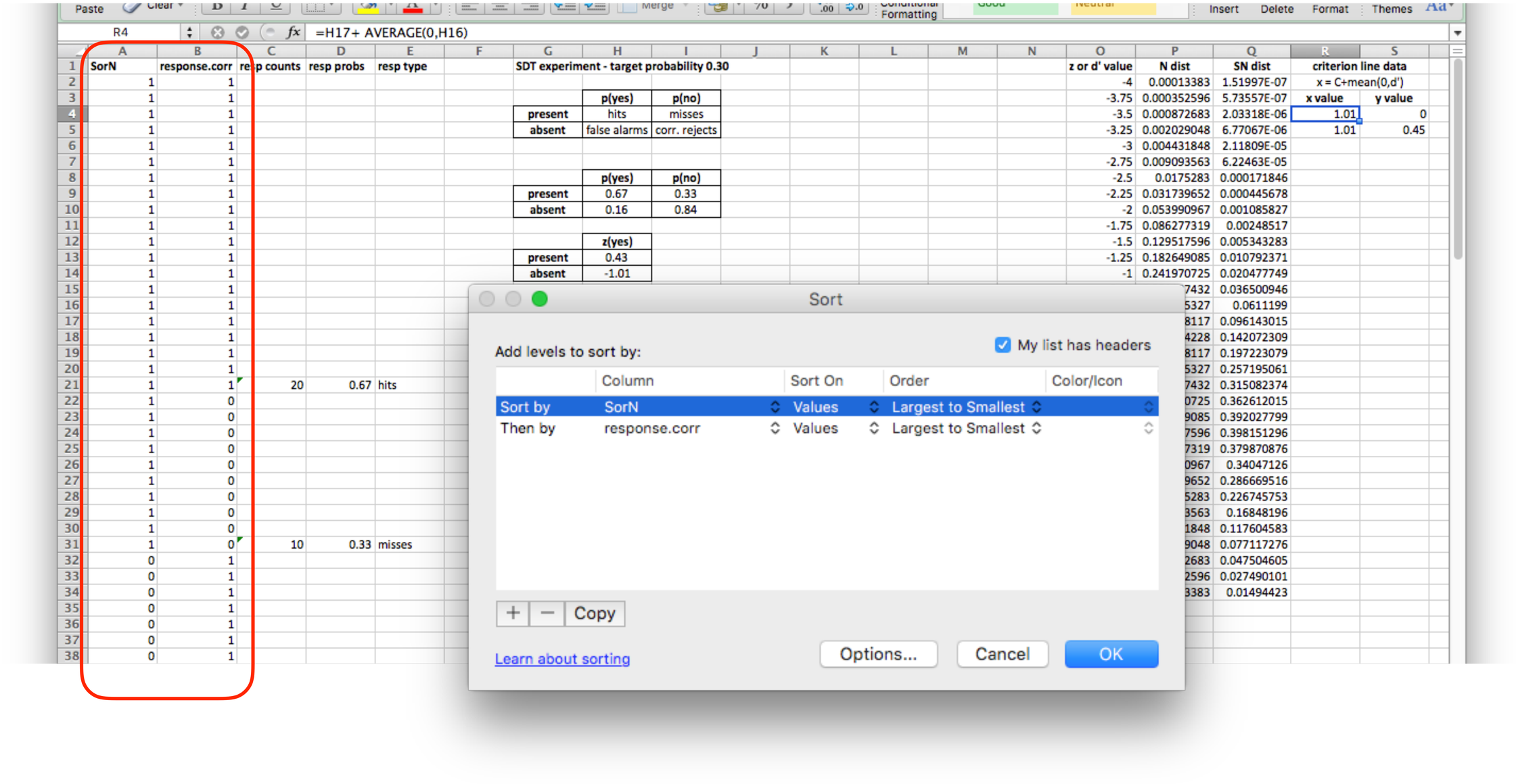
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1	tgt_sec	correctAns	SorN	tgt_opacity	practice_tria	practice_tria	practice_tria	practice_tria	trials.thisRep	trials.thisTria	trials.thisN	trials.thisInd	response.key	response.cor	response.rt	date	frameRate	expName	session	participant	
2	0.05	down	0	0.2	0	0	0	6								2017_Oct_18	59.7546448	sdt3	1	jafo20s50p30	
3	0.05	down	0	0.2	0	1	1	4								2017_Oct_18	59.7546448	sdt3	1	jafo20s50p30	
4	0.05	down	0	0.2	0	2	2	8								2017_Oct_18	59.7546448	sdt3	1	jafo20s50p30	
5	0.05	up	1	0.2	0	3	3	0								2017_Oct_18	59.7546448	sdt3	1	jafo20s50p30	
6	0.05	down	0	0.2	0	4	4	9								2017_Oct_18	59.7546448	sdt3	1	jafo20s50p30	
7	0.05	down	0	0.2	0	5	5	3								2017_Oct_18	59.7546448	sdt3	1	jafo20s50p30	
8	0.05	up	1	0.2	0	6	6	2								2017_Oct_18	59.7546448	sdt3	1	jafo20s50p30	
9	0.05	down	0	0.2	0	7	7	7								2017_Oct_18	59.7546448	sdt3	1	jafo20s50p30	
10	0.05	up	1	0.2	0	8	8	1								2017_Oct_18	59.7546448	sdt3	1	jafo20s50p30	
11	0.05	down	0	0.2	0	9	9	5								2017_Oct_18	59.7546448	sdt3	1	jafo20s50p30	
12	0.05	down	0	0.2					0	0	0	3	down	1	1.63878798	2017_Oct_18	59.7546448	sdt3	1	jafo20s50p30	
13	0.05	up	1	0.2					0	1	1	2	up	1	1.55401993	2017_Oct_18	59.7546448	sdt3	1	jafo20s50p30	
14	0.05	down	0	0.2					0	2	2	4	down	1	1.17031002	2017_Oct_18	59.7546448	sdt3	1	jafo20s50p30	
15	0.05	down	0	0.2					0	3	3	6	down	1	1.43773198	2017_Oct_18	59.7546448	sdt3	1	jafo20s50p30	
16	0.05	down	0	0.2					0	4	4	9	down	1	1.10379887	2017_Oct_18	59.7546448	sdt3	1	jafo20s50p30	
17	0.05	down	0	0.2					0	5	5	8	down	1	1.17140603	2017_Oct_18	59.7546448	sdt3	1	jafo20s50p30	
18	0.05	down	0	0.2					0	6	6	5	down	1	1.13746119	2017_Oct_18	59.7546448	sdt3	1	jafo20s50p30	
19	0.05	down	0	0.2					0	7	7	7	down	1	1.15330696	2017_Oct_18	59.7546448	sdt3	1	jafo20s50p30	
20	0.05	up	1	0.2					0	8	8	1	down	0	1.28688598	2017_Oct_18	59.7546448	sdt3	1	jafo20s50p30	
21	0.05	up	1	0.2					0	9	9	0	down	0	1.63688302	2017_Oct_18	59.7546448	sdt3	1	jafo20s50p30	
22	0.05	up	1	0.2					1	0	10	1	up	1	1.12040401	2017_Oct_18	59.7546448	sdt3	1	jafo20s50p30	
23	0.05	up	1	0.2					1	1	11	0	up	1	1.07023406	2017_Oct_18	59.7546448	sdt3	1	jafo20s50p30	
24	0.05	down	0	0.2					1	2	12	9	down	1	1.17038321	2017_Oct_18	59.7546448	sdt3	1	jafo20s50p30	
25	0.05	down	0	0.2					1	3	13	4	down	1	1.17030692	2017_Oct_18	59.7546448	sdt3	1	jafo20s50p30	
26	0.05	up	1	0.2					1	4	14	2	up	1	2.70588088	2017_Oct_18	59.7546448	sdt3	1	jafo20s50p30	
27	0.05	down	0	0.2					1	5	15	6	down	1	1.26947999	2017_Oct_18	59.7546448	sdt3	1	jafo20s50p30	
28	0.05	down	0	0.2					1	6	16	3	down	1	1.25428796	2017_Oct_18	59.7546448	sdt3	1	jafo20s50p30	

3. Open the data file from the **sdt30** experiment, create a copy of the data on a new page, move to that page, and save the file in the .xlsx format.

4. Delete the first 10 rows that represent the practice trial data

5. Delete all columns but **SorN** and **resp.corr**

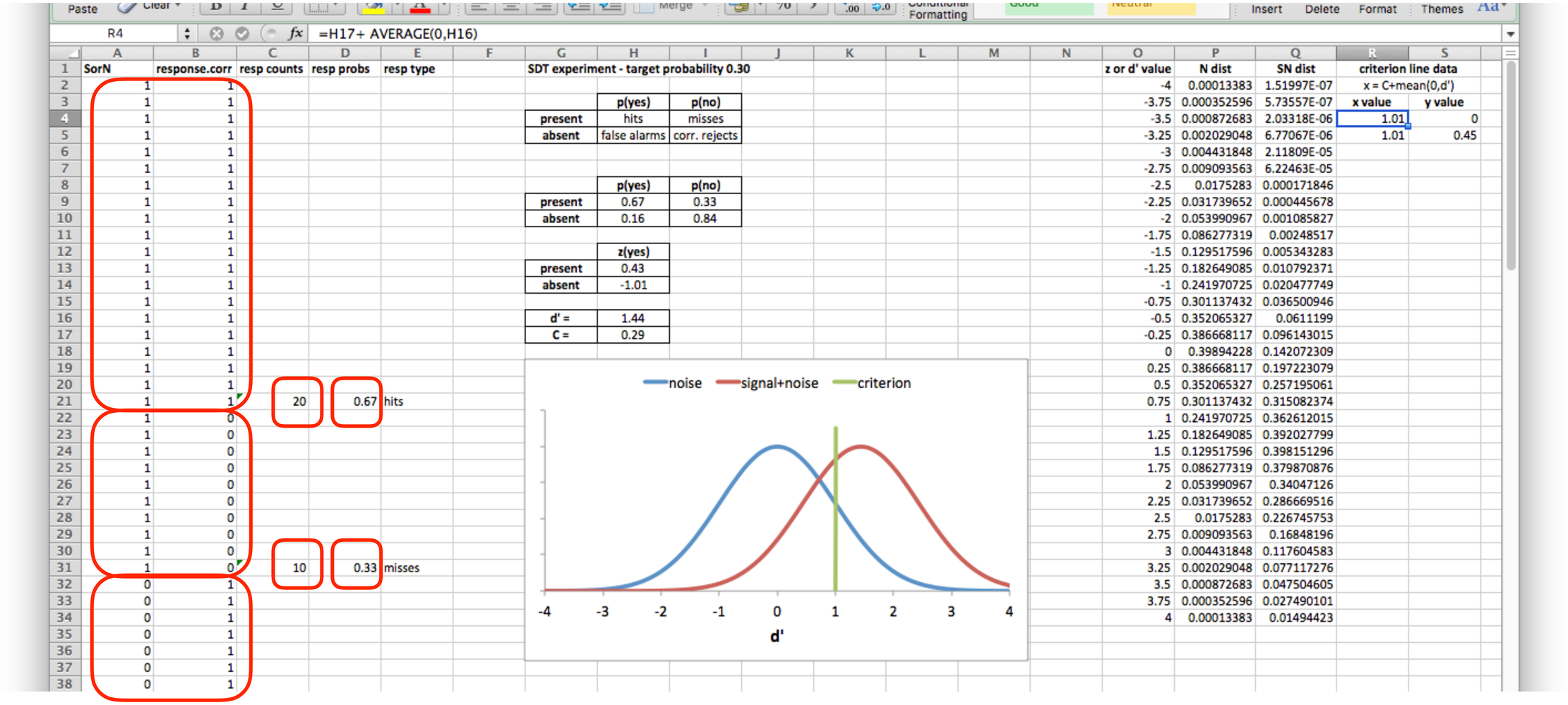
Lab 3 assignment: SDT analysis



6. Use the Data->Sort menu function to sort the data as shown

6.1. Clicking on the + button will add the “Then by” item

Lab 3 assignment: SDT analysis



7. The value pairs in the columns correspond to the different response types.

   (1,1) - hit (1,0) - miss (0,1) - correct reject (0,0) - false alarm

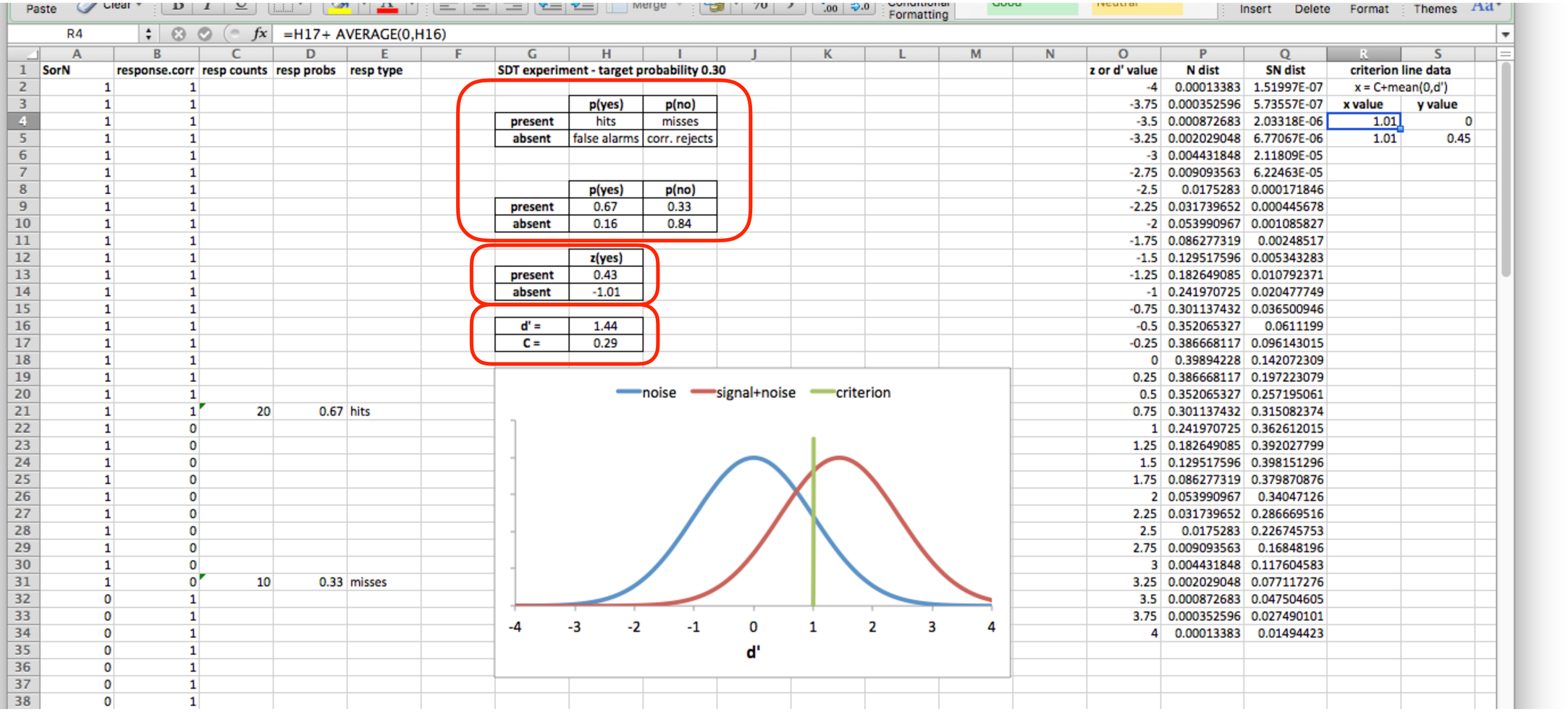
8. Use the Excel COUNT function to tally the number of responses of each type (don't forget to calculate the correct rejects and false alarms even though they're not shown).

9. Calculate the probabilities of each response type by dividing the count for the given type by the sum of the counts for the SN or N types, for example…

   p(hits) = count(hits)/(count(hits)+count(misses))

   p(correct rejects) = count(correct rejects)/(count(correct_rejects)+count(false alarms))

Lab 3 assignment: SDT analysis



R4 | =H17+ AVERAGE(0,H16)

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1	SorN	response.corr	resp counts	resp probs	resp type		SDT experiment - target probability 0.30								z or d' value	N dist	SN dist	criterion line data	
2	1	1													-4	0.00013383	1.51997E-07	x = C+mean(0,d')	
3	1	1						p(yes)	p(no)						-3.75	0.000352596	5.73557E-07	x value	y value
4	1	1					present	hits	misses						-3.5	0.000872683	2.03318E-06	1.01	0
5	1	1					absent	false alarms	corr. rejects						-3.25	0.002029048	6.77067E-06	1.01	0.45
6	1	1													-3	0.004431848	2.11809E-05		
7	1	1													-2.75	0.009093563	6.22463E-05		
8	1	1						p(yes)	p(no)						-2.5	0.0175283	0.000171846		
9	1	1					present	0.67	0.33						-2.25	0.031739652	0.000445678		
10	1	1					absent	0.16	0.84						-2	0.053990967	0.001085827		
11	1	1													-1.75	0.086277319	0.00248517		
12	1	1						z(yes)							-1.5	0.129517596	0.005343283		
13	1	1					present	0.43							-1.25	0.182649085	0.010792371		
14	1	1					absent	-1.01							-1	0.241970725	0.020477749		
15	1	1													-0.75	0.301137432	0.036500946		
16	1	1					d' =	1.44							-0.5	0.352065327	0.0611199		
17	1	1					C =	0.29							-0.25	0.386668117	0.096143015		
18	1	1													0	0.39894228	0.142072309		
19	1	1													0.25	0.386668117	0.197223079		
20	1	1													0.5	0.352065327	0.257195061		
21	1	1	20	0.67	hits										0.75	0.301137432	0.315082374		
22	1	0													1	0.241970725	0.362612015		
23	1	0													1.25	0.182649085	0.392027799		
24	1	0													1.5	0.129517596	0.398151296		
25	1	0													1.75	0.086277319	0.379870876		
26	1	0													2	0.053990967	0.34047126		
27	1	0													2.25	0.031739652	0.286669516		
28	1	0													2.5	0.0175283	0.226745753		
29	1	0													2.75	0.009093563	0.16848196		
30	1	0													3	0.004431848	0.117604583		
31	1	0	10	0.33	misses										3.25	0.002029048	0.077117276		
32	0	1													3.5	0.000872683	0.047504605		
33	0	1													3.75	0.000352596	0.027490101		
34	0	1													4	0.00013383	0.01494423		
35	0	1																	
36	0	1																	
37	0	1																	
38	0	1																	

10. Create a S/N response table like the one shown and insert links to the cells for the correct response types. Double check that the right types are in the right places.

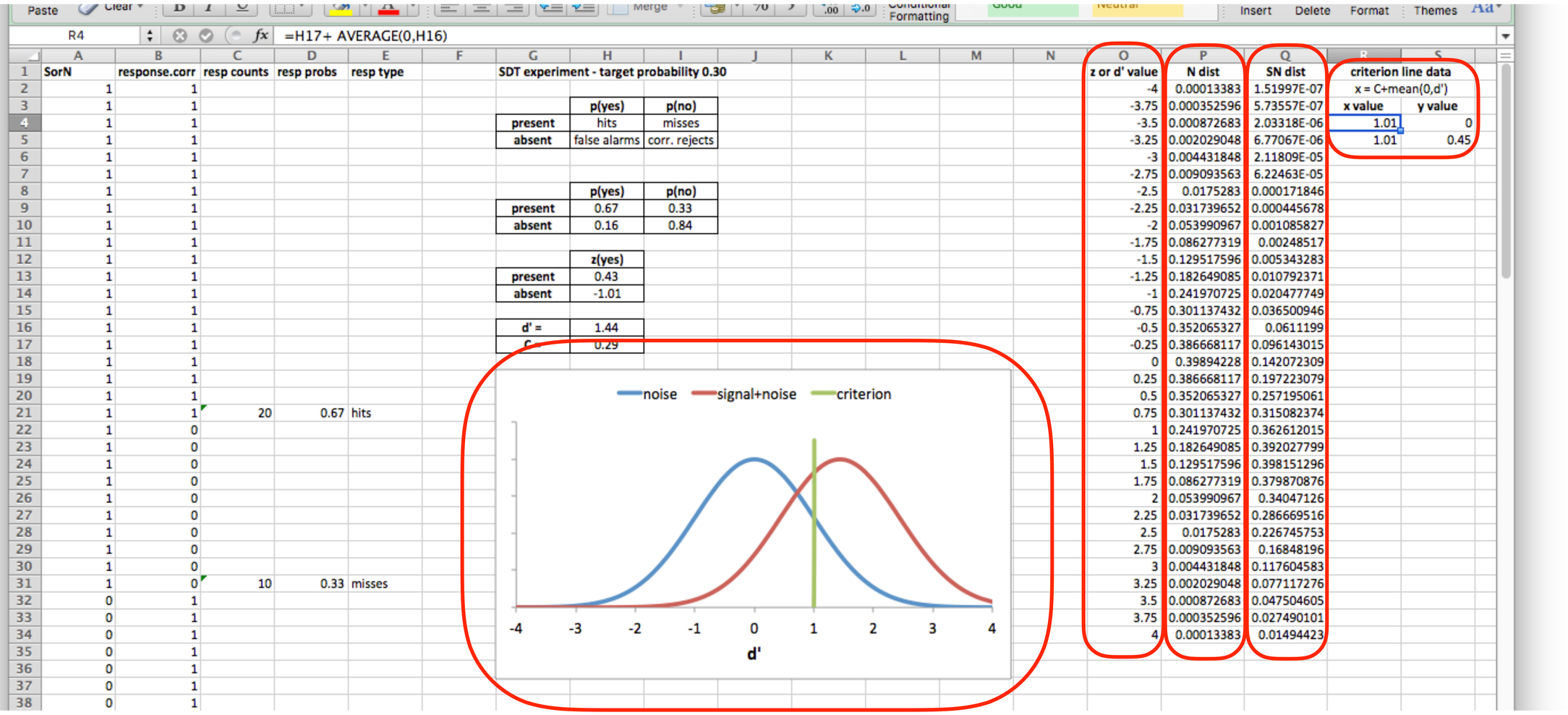
11. Use the Excel NORMSINV function to calculate Z values for the hits and false alarms and create the formatted table as shown.

12. Calculate sensitivity d’ and response criterion C using the following formulas and create the formatted table as shown.

    d’ = Z(hits) - Z(false alarms)

    C = -(Z(hits)+Z(false alarms))/2

Lab 3 assignment: SDT analysis



13. Visualize the experimental results by creating the graph shown. To do this

    13.1. Use the Edit->Fill->Series menu item to create the data for the d' axis (z values)

    13.2. Use the NORMDIST function to calculate the curve for the N distribution (z values, mean = 0, sd = 1, false)

    13.3. Use the NORMDIST function to calculate the curve for the SN distribution (z values, mean = d', sd = 1, false)

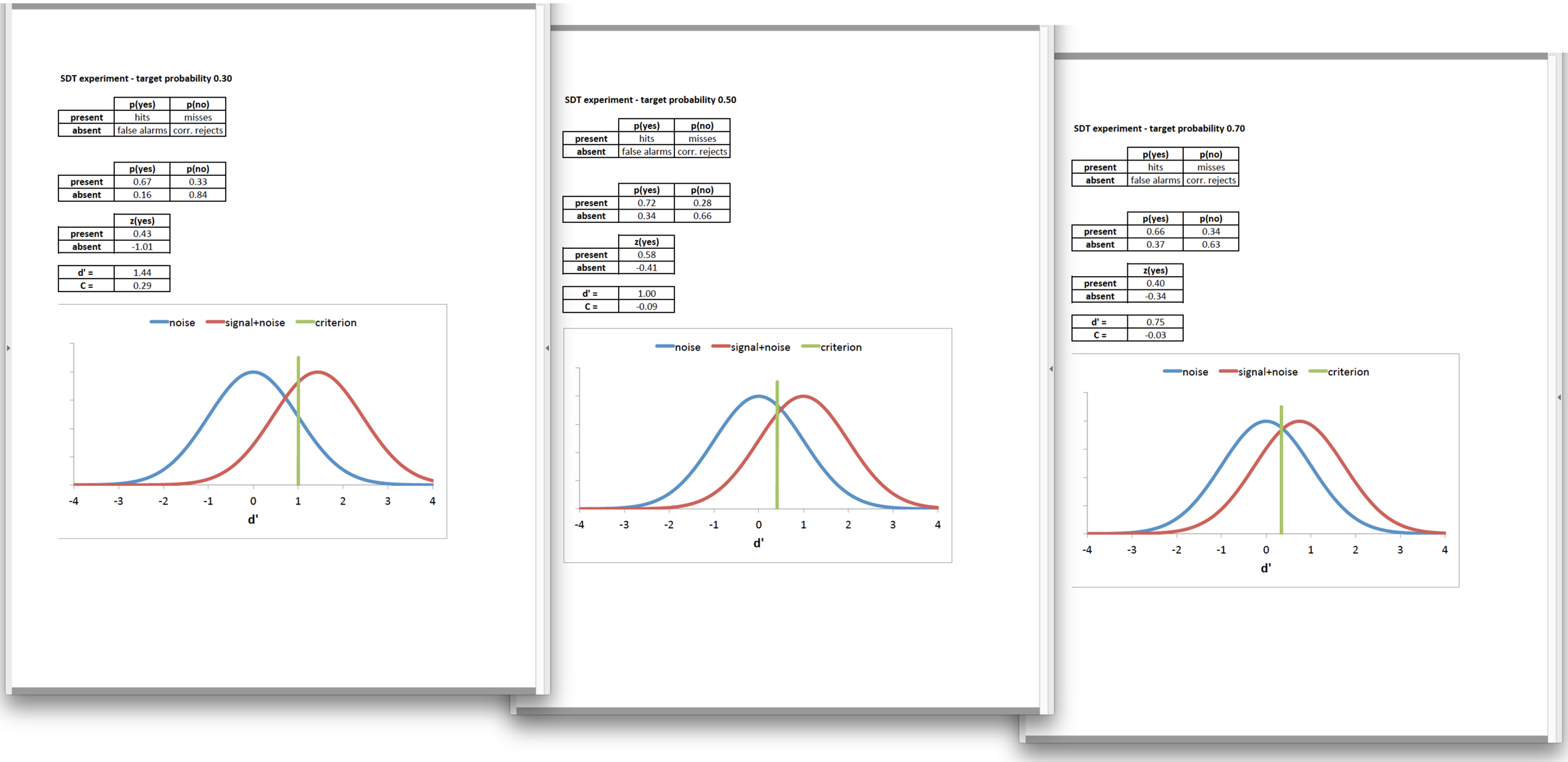
    13.4. Create the data needed to plot the line for the criterion C (x's = C+mean(0,d'), y's = 0,0.45)

14. Plot the data and format the graph as shown above

Lab 3 assignment: SDT analysis

15.Repeat steps 3-14 for the data from the sdt50 and sdt70 experiments

Lab 3 assignment: SDT analysis



SDT experiment - target probability 0.30

	p(yes)	p(no)
present	hits	misses
absent	false alarms	corr. rejects

	p(yes)	p(no)
present	0.67	0.33
absent	0.16	0.84

	z(yes)
present	0.43
absent	-1.01

d' =	1.44
C =	0.29

SDT experiment - target probability 0.50

	p(yes)	p(no)
present	hits	misses
absent	false alarms	corr. rejects

	p(yes)	p(no)
present	0.72	0.28
absent	0.34	0.66

	z(yes)
present	0.58
absent	-0.41

d' =	1.00
C =	-0.09

SDT experiment - target probability 0.70

	p(yes)	p(no)
present	hits	misses
absent	false alarms	corr. rejects

	p(yes)	p(no)
present	0.66	0.34
absent	0.37	0.63

	z(yes)
present	0.40
absent	-0.34

d' =	0.75
C =	-0.03

16. Create a well-formatted 3 page PDF named **yourlastname_lab3_analyses.pdf** that documents the your analyses of the three experiments as shown above. Use the images above as a guide for layout and formatting. Your document does not have to be identical, but it should be mathematically correct, correctly labeled, and legible.

Lab 3 assignment: submission

17. Create a zip file named **yourlastname_lab3.zip** that contains the following

    17.1. The original .csv data files from your runs of the sdt30, sdt50, and sdt70 experiments.

    17.2. The .xslx files that contain your analyses of the data from the experiments.

    17.3. The 3-page PDF you created in step 15

18. Submit the zip file to the lab3 dropbox by the due date

If for some reason your analysis is not working out, contact me for help and advice on how to proceed. For this reason do not wait until the last minute to do this assignment.